



**Euro-Biolmaging
European Research Infrastructure for Imaging Technologies in Biological and
Biomedical Sciences**

WP 3 Process Plan

Task 3.3

Working plan including how to integrate new partners and future trends in biomedical imaging

Deliverable 3.6

First working plan for implementation phase (updates on regular basis)

Task leader
MPG

November 2011

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1 Executive Summary

During the Preparatory Phase, Euro-Biolmaging is developing a working plan for the implementation and deployment of the biological and medical imaging research infrastructure starting in 2014. The Working Plan together with a concept for sustainable funding will be incorporated into the Euro-Biolmaging Business Plan, which will become the basis for decision-making by interested Member States to become Euro-Biolmaging partners and invest in the Euro-Biolmaging infrastructure.

This first draft of the working plan outlines the three tools Euro-Biolmaging has developed:

- to clearly define the unmet infrastructure needs for biological and medical imaging technologies of European Scientists
- to identify the best Infrastructure Model to address them and
- to specify the Eligibility Criteria that will allow Euro-Biolmaging nodes to provide open access to imaging technologies.

These tools have arisen from close consultation with national imaging communities, from information obtained through the Euro-Biolmaging Survey and the Euro-Biolmaging proof-of-concept Studies (PCS).

In addition, the first steps towards the Implementation Phase are provisionally defined, namely the first open call for Euro-Biolmaging nodes and a coordinated approach to provide funder's support for future Euro-Biolmaging nodes.

2 Description of the Work Package task and the deliverable

Based on firstly the close consultation with the European biological and medical imaging communities, secondly the survey of existing biological and medical imaging infrastructure and thirdly the proof-of-concept studies that test user access, Euro-Biolmaging is developing a working plan to outline the path towards the implementation phase (starting in 2014). The working plan addresses two major points of the overall Euro-Biolmaging Business Plan (D3.10 First draft of business plan), namely (1) the need for Euro-Biolmaging and (2) its physical and scientific research infrastructure model.

The first draft of the working plan (D3.6) is based on the results of the first year of the Euro-Biolmaging Preparatory Phase and will therefore be regularly updated to incorporate future deliverables in the coming two years.

The final working plan and the results from Task 4.3 (Identify funding requirements for establishing a pan-European research infrastructure for biomedical imaging) will be integrated into the Euro-Biolmaging Business Plan. The business plan will present the case for a harmonized approach towards European infrastructure for biological and medical imaging as well as provide financial, legal and access models for existing infrastructure to be opened for pan-European access as well as for the new infrastructure that is needed to fill gaps in the existing landscape.

2.1 Objective

The objectives of the final Euro-Biolmaging working plan are to make clear statements on:

- which imaging technologies are **needed** by European scientists
- which **infrastructure model** can provide open access to these technologies
- what the **eligibility criteria for specific technology nodes** of the infrastructure are
- what the **first steps towards implementation** of infrastructure nodes should be

This first draft working plan will outline the tools Euro-Biolmaging has developed to gather the facts required for these statements and the process that will lead to formulate them.

The final working plan will state how Euro-Biolmaging hub and nodes should be constructed and operated in order to successfully meet user needs by conforming with Euro-Biolmaging eligibility criteria, which will comprise cost, administrative, access, training and data management models. It will also include a strategy for integration of new partners and future biological and medical imaging technologies.

The final working plan will become an integral part of the Euro-Biolmaging Business Plan, which will provide the comprehensive information to make a compelling case for European Member/Associated States to invest into Euro-Biolmaging as partners.

2.2 Results - Working Plan for the Euro-Biolmaging implementation phase

2.2.1 Tools to gather the required information for the working plan statements

2.2.1.1. Close consultation with national imaging communities

Since early 2010, catalysed by the Euro-Biolmaging project, national self-organization of biological and medical imaging communities started in most European Member States particularly with the goal to support Euro-Biolmaging and to achieve pan-European integration of national imaging communities.

It was seen by several ESFRI projects currently in their construction phase that difficulties in the national coordination and prioritization process can become major obstacles for implementation.

Therefore, for Euro-Biolmaging, this process is invaluable to learn about national capabilities and needs in imaging infrastructure, different funding models and legal requirements. Most importantly, the imaging scientists start to identify common national strengths and needs and address their national and regional funders - the future partners of the infrastructure - with one voice for the first time, already raising awareness for the need to invest in biological and medical imaging infrastructure in their country. The process of formation and goals of these initiatives varies between the different Member States.

For countries where the national self-organization process is still ongoing, Euro-Biolmaging has outlined a procedure for this process to ensure inclusiveness and legitimization of the national coordinating persons by the community.

In a constituent meeting the national imaging communities appoint a national coordinating person who is responsible for communication between his community and Euro-Biolmaging. In most cases the community publishes its own website, organizes follow-up meetings after the first constituent meeting.

Euro-Biolmaging actively supports national imaging communities by participation of Project Management Team members at meetings and inviting their national coordinating persons to Euro-Biolmaging Work Package meetings.

The following national networks of existing imaging facilities and major infrastructure providers have already formed and in several cases, this has already led to significant national investments (e.g. FR, SE, IT) or application for national investments (CH, DE, FR, NL – see Deliverable D4.1 *Report on funding sources for the construction and operation of Euro-Biolmaging*):

Biolmaging UK
Czech Biolmaging
EuroBiolmaging-NL
Finnish National Imaging Infrastructure Network
France-Biolmaging
German Bioimaging
Greece-Biolmaging
Imaging Platform Ireland NBIP
Italian Bioimaging
(N)Euro-Biolmaging Poland
NorBiolmaging (Norway)
Spanish Biolmaging
Swedish Biolmaging
Swiss-Biolmaging

2.2.1.2. Euro-Biolmaging Survey

The survey was broadly advertised and openly accessible on the Euro-Biolmaging website from June 1st, 2011 to July 15th, 2011. The response rate to the European-wide survey was much higher than anticipated and the final data set comprises complete data from 660 individual participants. Imaging infrastructure providers are strongly represented, while the much larger number of users has been difficult to represent in an open survey. The survey results will be published as a strategic review of the European imaging infrastructure landscape and unmet user needs on the Euro-Biolmaging website and summarized in reports by the technical WPs (7, 8, 9, 10, 12 and 13) for the European Commission.

The goal of the open survey was to establish an inventory map of the existing imaging research infrastructure facilities including their training activities, and identify the infrastructure needs and requirements of future users. The survey addressed imaging infrastructure users, providers, funders and industry representatives from biological and medical sciences. The questionnaire included questions related to which imaging technologies are needed, access to them, management of imaging facilities, training, management of image data, collaboration with industry, and funders' expectations. The survey results will be an important data set to define unmet imaging infrastructure needs and the best infrastructure model for the future Euro-Biolmaging infrastructure nodes, especially based on the expectation of infrastructure providers that are in a key position to judge the future development in this field.

2.2.1.3. Euro-Biolmaging Proof-of-Concept Studies (PCS)

From January to July 2012, Euro-Biolmaging will conduct a series of PCS offering free access for users to 63 European advanced biological and medical imaging facilities in 16 countries. The participating imaging facilities have all committed to contribute free user access in kind to support the Euro-Biolmaging Preparatory Phase. The unique opportunity of free access to a broad portfolio of the most advanced imaging methods had been broadly advertised and applicants from the PhD student level up to senior researchers were invited to submit their project proposals from October 1st to November 30th, 2011. In this short time frame, already 228 proposals coming from European as well as international users were submitted, again surpassing all expectations and demonstrating the strong need for open access to biological and medical imaging infrastructure in Europe. Proposals will be evaluated for scientific merit by a panel of reviewers composed of experts from the Euro-Biolmaging consortium covering the different imaging technologies and assigned to PCS sites by a panel composed of the heads of the participating imaging facilities in each technology area.

The aims of the PCS are:

- to provide a first real opportunity for scientists to conduct their research projects by openly accessing cutting edge imaging technologies
- to identify user needs for access to different technologies based on all submitted project proposals
- to test and refine standardized execution and access protocols for future Euro-Biolmaging facilities by carrying out the best user-proposed projects
- to assess potential pitfalls for running these resources

2.2.1.4. Tools summary

The combined input provided by close consultation with the national communities, the Euro-Biolmaging Survey and Proof-of-Concept Studies will provide the required facts to allow the working plan to make clear statements on Needs for the Euro-Biolmaging infrastructure, the best Infrastructure Model to address them and specify the Eligibility criteria that will allow nodes of the future infrastructure to provide open access to imaging technologies.

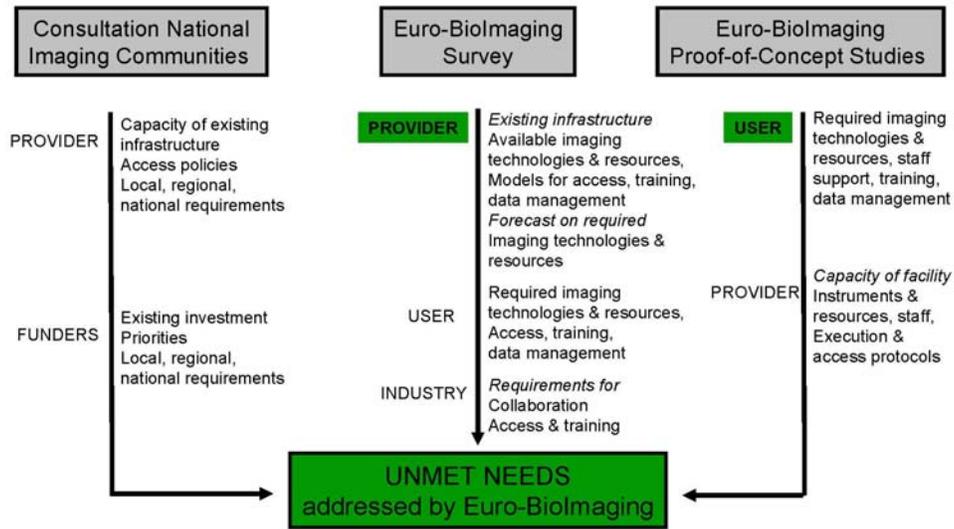
In addition to these tools, Euro-Biolmaging constantly consults all 1100 Stakeholders (status October 2011) via its web portal and at the annual Stakeholder meeting and regularly informs them about the status of the Preparatory Phase Project and collects their input in the different Working Groups.

2.2.2. The Need for Euro-Biolmaging

During the Preparatory Phase, Euro-Biolmaging will use the three tools outlined above to define the unmet infrastructure needs for biological and medical imaging technologies of European Scientists. The information delivered by the tools will allow Euro-Biolmaging to define:

- Existing European imaging infrastructures and available open access, training and data management capabilities
- Current duplication and fragmentation of imaging infrastructure efforts in Europe
- Needs for imaging technologies based on provider forecast in survey and user needs demonstrated by survey input and PCS applications
- Needed training of users and providers to use and operate imaging infrastructures
- Needs in image data management, analysis and storage

- Needs of European industry concerning access to and competitiveness in imaging technologies



This will provide the basis, to define the unmet imaging infrastructure needs that Euro-Biolmaging should address. The Inventory Map will define the status quo of currently existing imaging infrastructure across Europe and the degree to which it is openly accessible to researchers. The inventory map will present an overview of the currently applied access models (including cost models for open access), training programs of infrastructure users and providers and availability of additional resources such as data storage, wet lab space, animal facilities etc.

By comparing the openly accessible part of the inventory map to the newly requested and forecasted infrastructure needs for imaging technologies, user and provider training, data management and additional resources as well as the preferred cost models, the working plan will be able to identify gaps between user needs and the limited existing access to cutting-edge imaging facilities. Thereby the working plan will be able to make concrete statements on the needs unmet by the current infrastructure that Euro-Biolmaging should address by upgrading existing or establishing new imaging facilities.

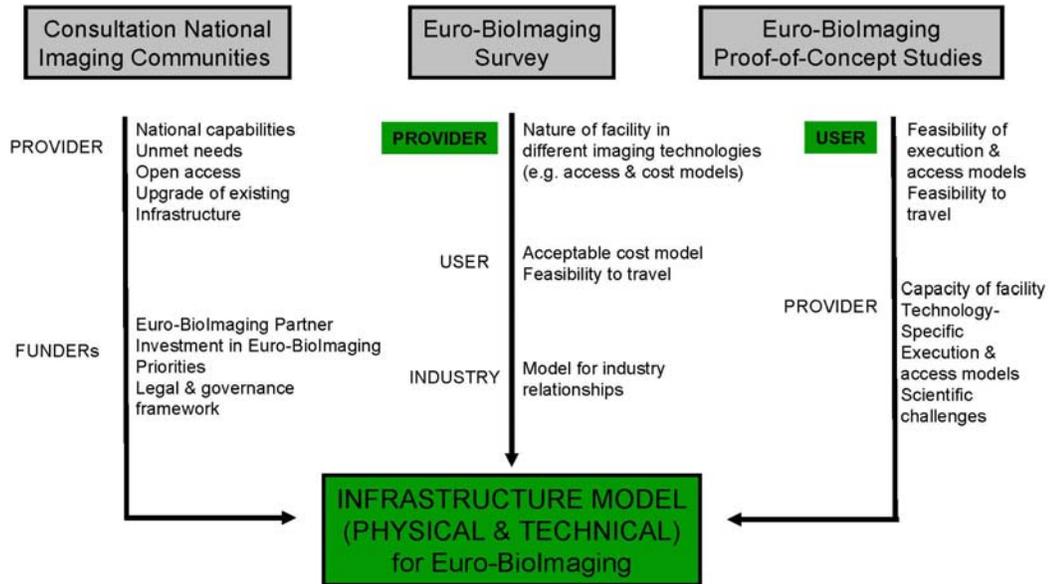
$$\text{User Needs} - \text{Openly Accessible Inventory} = \text{Unmet Needs}$$

2.2.3. The Euro-Biolmaging Research Infrastructure Model

The tools described in 2.2.1 will not only allow Euro-Biolmaging to define the imaging infrastructure needs of European scientists, but also provide the required information to define by which infrastructure model they can best be met. This will be particularly relevant to the following aspects:

- the science model (scope, benefits, user needs, scientific challenges, imaging technologies and coordination platforms provided and their respective access models; coordination of training and service)
- the physical infrastructure model (a distributed hub and nodes model, management of pan-European access to a distributed research infrastructure, list of required technology nodes, nature of facilities in different technology areas)

- model for industry relationships (based on continuous industry board consultation)



The legal and governance model of the Euro-Biolmaging infrastructure will be addressed separately by a comprehensive plan provided by WP2 in close consultation with representatives of the member states and the European Commission.

2.2.4. Eligibility criteria for Euro-Biolmaging infrastructure nodes to provide open access to the needed imaging technologies

Imaging technologies cover a very broad range and while Euro-Biolmaging will define and apply as much as possible standardized and common principles, each technology area will require a certain degree of specific criteria regarding access, training and services provided by the respective infrastructure node. This will be concretely formulated in the Eligibility Criteria that must be met by future Euro-Biolmaging facilities in order to provide open access to the identified imaging technologies to support unmet user needs. The eligibility criteria will be based on the key principles of technical and scientific excellence, open access and highest quality of service, facility management and user training. These eligibility criteria will detail for each technology/area the criteria for access provision, user and provider training and additional specific services. Once defined for an imaging technology, they will provide the construction framework for nodes in this area of the future Euro-Biolmaging infrastructure. Since even already existing sites are expected to require major upgrades to provide open user access of the highest quality, a key eligibility criterion will be credible support by national, regional or European funders to make the required investment. The open call for nodes (2.2.5.) will be used to trigger the coordinated approach to funders by candidate nodes and the Euro-Biolmaging consortium (2.2.6.).

2.2.5. First steps towards infrastructure implementation: open call for Euro-Biolmaging nodes

After defining the eligibility criteria for Euro-Biolmaging nodes in the different imaging technology areas as described above, the Euro-Biolmaging Preparatory Phase Consortium will publish an open call for future nodes of the infrastructure. As progress in different technology areas may occur asynchronously, several calls may become necessary to address all technologies needed by scientists.

Facilities applying to become nodes will be evaluated by independent international imaging infrastructure experts based on how well the facility addresses the eligibility criteria e.g.

- meets eligibility criteria completely (eligible for becoming Euro-Biolmaging node)
- meets most eligibility criteria (only minor adjustments required to become a Euro-Biolmaging node)
- needs significant improvement but is of interest for Euro-Biolmaging as future node
- does not meet eligibility criteria

2.2.6. Coordinated approach to provide funder's support for future Euro-Biolmaging nodes

In addition to the eligibility criteria to provide imaging technology to support user needs, credible funder support for the required investment will be key to construct nodes. We will therefore take a coordinated approach to member state funding agencies centrally by Euro-Biolmaging and nationally by candidate nodes that wish to apply to the open call. By coordinating and prioritizing plans for nodes in each members states imaging community, strong cases to national funders can be made to support the construction of the nodes that are in a good position to meet the eligibility criteria and are needed and supported by the imaging community. Euro-Biolmaging will closely coordinate this process in the different member states and provide administrative, technical and scientific support to candidate nodes.

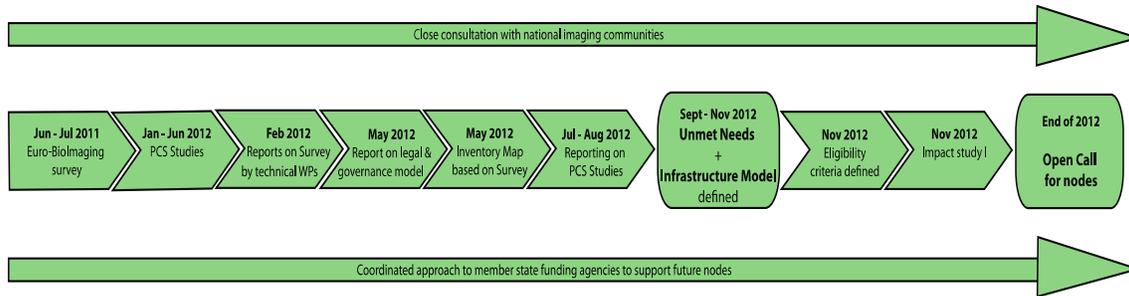
Should the incoming applications from facilities to the open call not cover all needed imaging technologies, Euro-Biolmaging will actively address potential technology experts and funders to consider and plan construction of new infrastructure in this technology and apply to future calls for nodes.

2.2.7. Towards a road map for implementation

The road map for implementation will provide an overview of the implementation time schedule including:

- Time point target
- Objectives
- Estimated costs related to the objectives

The current Euro-Biolmaging timeline projection shows the tools and deliverables prepared during the preparative phase as well as the transition to the implementation phase. The timeline will be updated and revised in each successive version of the Working Plan:



The legal, governance, ethical and financial issues are being addressed as follows:

Legal, governance and ethical issues (WP2): The first deliverable of WP2 that deals with the evaluation of suitable legal structures was postponed until February 2012. Based on the outcome of this evaluation and a report on governance and legal issues (due in May 2012) a decision about the legal framework and the governance structure has to be taken (due in December 2012). An important step for the legal and governmental implementation of Euro-Biolmaging structures may be to develop a Memorandum of Understanding to be signed by those member states participating in and committed to supporting Euro-Biolmaging infrastructures that may also include decisions or guidelines for appropriate operational models.

Finance planning (WP4): The financial requirements and a suitable funding model for Euro-Biolmaging are evaluated and developed by WP4 and will be part of a separate report. The first deliverable of WP4 "Report on funding sources for the construction and operation of Euro-Biolmaging" (D.4.1) was submitted in November 2011.

2.2.8. Impact Study

The number and technological focus of future Euro-Biolmaging nodes will be evaluated by impact studies that will continuously assess the strategies and measures introduced and provided by Euro-Biolmaging for enhancing and enabling the European research landscape. The goals of the impact studies will be to continuously review the impact of the measures taken to ensure the maximum return on investment and maximum cost effectiveness in implementing infrastructures to support top level research and European competitiveness. The first impact study is due in November 2012.

3 Conclusion

The first Working Plan for the Implementation Phase outlines the path to the statements the final working plan will make in order to successfully meet user needs by European Scientists. It focuses on the first year of the Euro-Biolmaging Preparatory Phase and its results and will therefore be regularly updated to incorporate future deliverables and results such as the inventory map, the results of the PCS, the decision on the legal and governmental model and the definition of the Euro-Biolmaging eligibility criteria.